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THE BOURSE BALL OF STOCKHOLM.

The last night of the year is always a solemn, and sometimes a melancholy time; and the first day of the new year is one which memory ever seems to make her own. But the past must not exercise its spell over me. Alone, in a foreign land, for the first time in my life, on a New-Year's Day, its magic would carry me I know not whither, but somewhere out of Sweden, at all events; and dreary would be the consequence if I were to sit down quietly, and let that mesmeric spell enthrall me. Away, then, must I resolutely rush from a trance that would drift me, not into the future, but into the past. The lights are gleaming brightly in the churches, the snow shines white in the darkness, the storm-clouds are between us and the moon; one little star looks out from heaven, and seems to sing its silent song of hope and love and constancy to the children of time and earth.

It is half-past six o'clock on New-Year's morning. My cloak and hood and long boots are put on, and tell it not in the streets of Stockholm!—I steal out alone, quite unattended even by a lantern or a servant. In three hours' time, the sun, if we have any to-day, may be expected to appear, and daylight to dispel the present gloom; but Stockholm is economical in oil, and the street-lamps are not lighted when the moon is expected to shine. When her large, beautiful orb hangs suspended in the clear atmosphere, I admire exceedingly the economical principle; but when the Queen of Night is unable to fulfil the engagements made for her by the almanac, it is rather awkward to find her deputies also absent from their posts. It was dark now—at least as dark as northern nights usually are, for the sky was laden with snow-clouds: the cold was the most intense I had yet felt; the keen wind made it almost intolerable; but lanterns carried by servants were moving, with ladies, to morning-song at the fashionable church, the brilliant lights from which guided me onward; behind, from the headless but snow-covered trees, there gleamed long, straight lines of light where all else was dark; the snow was knee-deep at the sides of the streets, but as hard as iron under foot on the ground. The coachmen, or rather the sledge-drivers, wrapped in fur, walked with folded hands and faces buried in their great capes, beside their patient, drooping, evidently frozen horses. The crowd at the church was already nearly as great as on Christmas-morn, but the number of children was far less. The piercing cold made me anxious to get in; but when I effected an entrance, the icy feel of the floor I stood on seemed to penetrate throughout my whole frame. The floor was a wooden one, too; but the Swedish churches are never warmed: they say they

cannot be warmed. I suppose the difficulty is merely one of cost. The consequence is, that unless on great occasions, or when a pet preacher is to be heard, they are left nearly empty in winter. One Swede told me his life was too valuable to be thrown away by going to church. When I got in, the priest, as every clergyman of this Lutheran land is called, even when conversing with him, was in the pulpit. New-Year's Day being a holiday, he was attired in the full and gorgeous robes worn on particular occasions. The dress differs little from that used by the clergy of the Roman Church, except that it is more splendid than we ordinarily see among the latter. The chasuble, of rich crimson velvet, is nearly covered by an immense gold cross, which, when the priest officiates at the altar with his back to the people, is seen extending from his neck nearly to his feet, and across from shoulder to shoulder. The church of Sweden, however, is exclusively, and even bitterly Protestant; so much so, that a Swede is exiled for ever from his country if he forsakes that faith. But they retain many of the old practices and opinions together with the new ones, which assimilate more nearly to those of Presbyterianism. A Swedish church-yard is generally covered with rows of crosses, often only of wood, for no one thinks of being buried without a cross on the tomb.

But the morning-song is over, and I shall stay no longer to make remarks on the Swedish church, for I feel, as that good man said, that my life is too valuable to be thrown away.

New-Year's Day is the season for ceremonial visiting in Sweden; St Stephen's Day, as I mentioned in my last, is devoted to friendly, family, or social entertainments. A short time ago, it was the custom for members of the diplomatic corps, government-officers, and other officials, professional men, &c., to go in the uniforms of their rank or guilds, to wait on their superior, and offer the compliments of a new year. Old customs are dying out with amazing rapidity everywhere; and even here, only a few out-of-the-world folk, who move in the past more than in the present, keep up this old-fashioned custom, and present themselves, duly equipped, on the 1st of January, at the houses of their chiefs; but now they are only laughed at for their pains. Still, every one goes to call on every one on New-Year's Day. The crossings and recrossings must be numerous; and as—independently of the fact, that if every one is out, no one can be at home—morning visitors are rarely received in a capital where every winter evening is spent in balls or receptions, I should think the number of cards exchanged on New-Year's Day in Sweden must come to a curious amount.

Whatever old customs may die out, one, of a rather

singular nature, still gives a sort of éclat to this day in Stockholm. It is that of the Bourse Ball, or, as we speak in English, the Exchange Ball—an annual festival for the king and royal family, given by the burghers or corporation of Stockholm to their majesties. To this ball they are invited by the towns-people; and to it all who are able to pay one rix-daler, or 1s. 2d. English money, are at liberty to go, provided only that they are not exactly outcasts from decent society.

As I naturally felt desirous to share the honour, or curious to see the sight, I very willingly paid my rix-daler, and attired myself in my best black dress. Only black and white are permitted where their majesties are present; and if the two state colours were worn on the same person, the magpie aspect of a court ball-room would be complete. But this is not so. A white dress says you are young, or wish to dance; a black, that you are old, or not a dancer. I took the black; the two fair Swedes I chaperoned took white, and we set off together to the Stockholm Exchange.

Now, as it is no trifling honour to be for once in one's life in society with royalty, to see the king's sons dance, and even to have a chance of dancing with them, you may fancy what a gathering there was in the great ball-room. For my part, I had lived on hope almost all day, for that New-Year's Day was a dreary one to me. The only English friend I had to think of me in Stockholm, was our highly-respected British minister, and his sweet and estimable lady; and he was the only one of the foreign ministers absent from this curious assembly, for a domestic trial secluded him in the Embassy, which at other times was made the scene of hospitality and kindness. Any little distraction was accepted by me with pleasure. We left the house at six o'clock; the royal party were not expected till nine; but Swedish zeal, in all cases of sight-seeing, especially in royal sights, is most enduring. The ball-room was more than half-full when we got in. The ladies were all ranged in tiers on benches placed round the walls of the room; the men stood in the centre. The separation both of sex and age is a general peculiarity of Swedish society; but in this case, the first part of the distinction only was preserved. Young and old ladies had to sit together; the men were obliged, whether they liked it or not, to stand grouped in a mass. As they always escape as soon as possible from the ladies' society, it was rather pleasant to feel that, for the sake of a seat, some of them would now be glad to come into it. But this was not allowed; and there we sat, awfully stupid, it must be confessed, for the space of nearly three hours of this mortal life. As the room filled, the confined and heated air became oppressive; my courage was giving way, when, lo! at once I saw that the throne—erected on a dais beneath a crimson canopy exactly opposite to me—was filling. King Oscar was standing before it, with his amiable smile and gentle bow; the graceful queen, her sweet young daughter, and three sons—Gustaf, Oscar, and Auguste; and to crown all, the dashing and splendid crown-prince, the eldest of the charming family, and his young Dutch wife—all were there. The king and queen used to dance at this ball with their good towns-people, but they have now abdicated in favour of their children, whose duty this night was no very easy one.

The royal chamberlains were immediately sent about with invitations. The queen, the granddaughter of graceful Josephine, with a pretty movement of her hand, laid her royal commands on her youthful sons, who instantly rose with submissive alacrity, unbuckled their sword-belts, and descended the throne steps to receive the citizen partners allotted to them. The two young princesses set off in a waltz with two portly merchants, and the usual furious dance instantly began; down the entire length of that long room, round the centre group of standers, and up again. A lady falls under their feet; but the eye cannot take in the

prostrate form before it sees it again circling away, half-borne up in the strong arms that certainly must lighten the exertions of the fragile-looking creatures, who, night after night, through the winter season, keep up this violent dancing. The black head of the handsome crown-prince looks soon as if he had come out of a vapour-bath; but he has only time to mop it up with his handkerchief, and set off in a whirl with a fat lady in black velvet. And his young wife, whose infant is little more than a month old, is dancing too, but more quietly, for her partner is a grave burgomaster.

This ball, I suppose, is meant to be on the principle of liberty, equality, and fraternity; and, indeed, I suppose that principle is as much carried out at the Bourse Ball of Stockholm as it is anywhere else. The humblest tradesman's wife or daughter says she has as good a chance of dancing with one of the princes as any one else. So it may be, but somehow the chance does not come. 'The eleven old men' of Stockholm—that is, I believe, of the heads of the corporation—settle all that.

After about two hours of most vehement exercise on the part of some of the assembly, of absolute stillness and wearisome dulness, as I should call it, on the part of the rest—that is, of the half-withered and closely-packed wall-flowers—the royal guests (who had sustained their parts admirably, the queen in beating time and nodding her head, the king in bestowing grave smiles of approval) were invited to supper, and all the assembly partook of refreshments: ices, bishops (not mitred ones), and cakes, being abundantly supplied.

As soon as this was over, a curious progress was made by each of the royal guests separately round the room. It was commenced by the crown-princess, instead of by the queen; why, I know not, unless a suspicion may arise that a retirement from actual duty at the annual Bourse Ball is contemplated by the reigning powers of Sweden. The Crown-princess Louise, conducted by her chamberlains, began the circuit of the room, along the avenue lately occupied by the dancers, and now left vacant between the centre group of male standers, and the ladies sitting in rows against the wall. Every one now had an equal chance of speaking to royalty as they had had before of dancing with royalty; but somehow the chances seemed to run all in the same line, for whoever had danced with the prince, the princess stopped and spoke to. The chamberlains informed her of the identity, or good-natured told her who was who among the eager aspirants for a word.

The task of talking, bowing, and smiling was evidently no easy one to her royal highness—her handkerchief rolled into a ball, and constantly applied to her face, together with an uneasy writhing of the person, seemed indicative of a still more anxious state of mind than that of the citizen-ladies before her, who regarded her with that sort of expression which I have not seen any but a Swedish countenance to wear—an expression of what one must call pity, and yet of admiration, wonder, and respect: they always wear it when looking at a bride, and generally when gazing at royalty. Next came the queen, in crimson velvet and tiara of diamonds; all smiles and graciousness—so very gracious, that it recalled to my mind what a very old lady, who was maid of honour to the queen of the murdered Gustavus III., told me a poor Swedish soldier, with a wooden leg, said of Bernadotte, his majesty's father, when he gave him an addition to his pension at her request: 'Madame, his majesty is insupportably good.' She had a word for some, a bow and smile for all.

Then the young Princess Eugenie made her rounds; affable and desirous to please, as she always is, more by nature than by study. Seldom has a more simple and amiable girl borne the title of princess.

But the jewel of all was the little old queen-dowager, the widow of the renowned Bernadotte. On she comes, nodding the white plumes of her turban, and looking

so unutterably self-content; glancing through her eyeglass, and holding it up to her chamberlain, while she asks: Who is that? and who is that? without ever caring to hear the answer; but nods and smiles in her litte French manner; and goes on, taking all the amusement of whatever is to be seen or done, and leaving the other part of the business to any one else—for she has never learned to speak Swedish, and her own dear French is spoken only to herself and to her chamberlain. After the royal ladies had made their rounds, King Oscar made his. To his majesty, this talking promenade must be one of the heaviest burdens of his regal state. He is not formed by nature to shine in such a thing; he is nervous and embarrassed in mere chit-chat, although in quiet conversation, or in literary or scientific company, he can converse well. But at all times his amiable manner and benevolent smile speak for him. The young princes followed their father's example most sedulously; took notes from their attendants of all the persons he spoke to, and spoke to them also. I seldom have seen altogether a prettier pantomime than was enacted, especially when the king and queen sat in their throne-chairs, nodding approbation to each other while their subjects danced, beating time to the music, or beckoning the young princes, who sprang with reverent alacrity up the royal steps, received gracefully a royal command, bowed, and hastened to gladden some loyal heart by its performance.

Shortly after midnight, their majesties retired. We were then at liberty to do so likewise; and after sitting motionless for six hours, a change would not have been unwelcome, to me at least. But all were not of my mind: my white-robed companion, with pink roses in her hair, most ardently longed to dance at the Bourse Ball, while her humility made her think the hope was quite a forlorn one. My eye, however, discerned a very fine young English officer, a really bold dragoon, who had quartered himself in Stockholm. He saw me, and came up to our bench, told me he had come to the North in search of a wife, and asked me to recommend him one; and I—not foreseeing the penalty of an attempt at match-making—at once introduced him to my fair Swede: she was a little brunette, however. The Englishman, perhaps not supposing that I meant in this off-hand manner to give him a partner for life, merely requested her to be his partner in a waltz, which the Swedes affirm no Englishman can dance. Nothing can be more reserved and proper than a Swedish lady's demeanour, and of course more so in the middle ranks than in the higher; yet it would have been a thousand pities if that pretty white dress had been put on for nothing; and whether it was for that reason, or that the saucy look and handsome face and outstretched hand of the young Englishman, with the only intelligible word he could speak—'Come'—were quite irresistible, I do not clearly understand, but the result of all was, that she did give him her hand. And really, if he had promised to keep it for life, I should have been quite willing to leave them dancing there, and go home to my own solitude, and sleep; for dance, dance, dance they did; and my head ached, and my heavy eyelids almost closed, and two o'clock sounded from the Stockholm bells, and I had sat on that seat for eight long hours; and I resolved, whatever else I did, never again to chaperone a Swede in a white dress to a Bourse Ball.

More pleasant to me, I must confess—as I do not wear white dresses, the sign of a dancing lady at a court-ball—was the solitary walk I took to revive myself the next day, after having been up from six o'clock on New-Year's morn, to three o'clock on the morning after it.

The Bourse Ball was a curious spectacle, as a national institution of very ancient origin; but nature has ever been my friend—almost my best friend; and from

artificial life how gladly the spirit rebounds to her who has blessed our childhood, cheered our youth, and consoles our age! The day, the 2d of January, was one of the finest and brightest imaginable; the sun was warm and clear—the temperature in the shade was low. The snow lay deep, and sparkled in the clear light. I walked over Skeppsholmen, or the Isle of Ships, where the Admiralty offices and naval institutions are situated; a pretty island and walk it is. I crossed the bridge of boats, which in winter supplies the place of the movable ones that ply between the capital and the charming royal park called Djurgarden; but I did not see the boats, or perceive that any bridge was there, or any water either; that branch of the Baltic was now all ice, ice hard and immovable as any road, so that I did not know I walked on water. And then I was in a beautiful place, where dark tall pines rose amid snow-covered rocks, that glittered in the sunshine; and I trod nearly knee-deep in snow to avoid a beaten path; and I enjoyed myself exceedingly. Beautiful were those rocky heights and dark fir-trees, rising in snow and sunshine; beautiful the wide-spread landscape round about; still and calm and bright was the whole scene; the frost-king and sun-king were each triumphant, and each seemed equally secure of his reign.

Alas for such expectations! Talk of the instability of England if you will, Mr Swede, but what will you say to this?—1st January—Bitterly cold and dark. 2^d January—Warm and bright, and very calm. 4th January—Blowing a hurricane—piercingly cold; and so on, says my note-book. It is curious to an English person to be made sensible of a storm only by hearing the reports of those who have been out of doors, or by seeing, not feeling, its violence. The day following my walk, the cold was again extreme; and the day after that, the wind rose to a gale, but without shaking the immensely thick walls and firm-set windows of my dwelling. Remembering the groaning, creaking, rattling of an English house in a storm, I feel amazed at seeing the effects of the wind from my window, without feeling the least movement or breath of air around me. Certainly our English walls, doors, and windows do us no credit; and I wish we could borrow a hint from a nation that is admitted to be a century behind us in the arts and manufactures and conveniences of life.

This gale subsided, not into snow, but rain, such rain as even this wet autumn had not produced; and for twenty-four hours it continued incessantly. Not a trace of snow remained on my favourite Place, only patches of it lay still on the heights of Söder. The sledges were put up, the carts began to rattle; I lost my temper, and the Swedes lost their spirits. The snow had melted from the Place, and its unbroken surface looked like a lake. But to my no small perplexity, I saw boys sliding on what appeared to me to be merely a sheet of water formed by the melted snow. They cut figures and capers, they threw parcels before them, slid after them, and took them up without stopping. What can it be? are they running over water? Three o'clock came: it was dark; the lamps in the streets and in the houses were lighted; the lights sparkled here, there, everywhere, up and down and around my Place. I went to the window, and uttered a cry of delight—my whole Place was a sheet of glittering crystal, reflecting in its polished mirror a treble row of sparkling lights. No; words cannot tell how beautiful it looked. The snow had melted off and left the ice wet underneath; in the day it looked like water, in the night it was hard, clear, shining glass. The only thing I ever saw at all resembling it, but on a smaller scale, was an underground lake in one of the Austrian salt-mines, which was encircled with small lamps: the white heaps of salt around it might look in the gloom like the snow of Sweden.

And so it remained, a nightly delight to my eyes for some time. Then came the snow again—a regular

snow-storm, the first I had seen in the North. It drove along in a white moving cloud. The ever-changing aspect of my Place was now most singular: my crystal lake, indeed, was gone; but through the white driving mist, rapidly-driven sledges were seen traversing the road that lay between it and the water where the vessels were laid up; and all was seen as if through a white veil. The tall bare masts of the ships, and the formal lines of trees, were curiously mystified. The wild and angry storm had something so strong and cruel in its breath, it lifted the snow, and whirled it round and round, and up like a spray-cloud to the dark sky; but still the snow came again, and grew deep and deeper, and would rest there still when the storm-fit was over, like Patience beneath the assaults of a tyrant.

'Now, then,' said my old countess-housekeeper, smiling widely, and rubbing her hands—'now, then, you begin to see our winter; you never saw anything like that before. You have no snow in England—I know that: no sun either—nothing but fog.'

As I never contradict the good woman's assertions, knowing it would be impossible, when they are once made, to change their character, I let judgment go by default, and her verdict against English snow and sunshine was unquestioned by her hearers. I only looked from the window of her great *salong*, and said: 'How frightful!'

'Frightful! not at all; we shall have it good now: that is beginning. The snow will rest on the ice now, and then it will freeze and become hard, and so we shall have a good winter, and the industry will go on. Yes, madame, that is better than the fog of England. We can travel on sledges here, and we have warm stoves, which you never could learn to make or use in England; so that one of our ministers who went to London was all roasted—yes, roasted—on one side, and frozen on the other. Yes, that is true; he never recovered it, and has the liver-complaint to this day.'

'Was that the overdone or underdone side?' I inquired, very gravely; but my hostess was pouring forth such a volume of information to the rest of her auditory on England and the English, that my query remained unanswered.*

THE WATER-BUTT.

THE sanitary value of good water, and of a plentiful supply of it, has become so generally understood, or rather admitted, that the surface of our island is being bored and walled, piped and drained, in all directions, in search of the precious liquid. But the subject is far from being, even yet, generally understood: people are willing to admit the facts stated by our sanitary reformers and Boards of Health, but they do not quite understand the reasonings which are supported by the facts. Does one kind of water wash clothes as well, and make tea as well, and boil meat as well as another; and if not, why not?

The chemistry involved in the differences between different kinds of water is not very complex. Absolutely pure water is never, perhaps, found in nature; for, being a powerful solvent, it is pretty certain to contain some foreign ingredient. Very clean snow yields the purest water, except that which has been distilled. Distilled water is vapid and tasteless as a beverage, and is not in favour in its simple state, but it is invaluable in medicines; and it would, if it could be procured with less trouble, be much employed for washing and cleaning, as it dissolves soap better than any other water. Rain-water, if caught before it has had time to become defiled by dirty roofs and smoky chimneys, is very nearly pure, especially if filtered to

remove any merely mechanical impurities; it is useful for all domestic purposes, and is, moreover, rendered drinkable by the air which comes in contact with the drops as they fall. Spring-water, derived from rain which has flowed over or through mineral beds, absorbs carbonate and sulphate of lime and other salts, and becomes thereby 'hard.' In softwater, soap dissolves without curdling, and washes with a lather; whereas hard water curdles the soap. Spring-water that contains carbonate of lime may be rendered soft by boiling, which throws down the carbonate in a solid state, forming the *furr* which so often lines our tea-kettles. If the water contains sulphate of lime, the separation cannot be made by simple boiling; but on adding a little soda, the sulphuric acid leaves the lime and seizes on the soda, allowing the lime to fall as a white sediment. Well-water and river-water, like spring-water, are derived originally from rain, and acquire their mineral qualities from the surfaces over which, or the strata through which they flow: they become hard or soft, pure or impure, therefore, according to circumstances.

The curious action of hard water on soap cannot be understood without paying a little attention to the chemistry of soap itself. What is soap? It is a chemical union of fat and an alkali; the fat may be oil, or tallow, or grease, and the alkali may be soda, or potash, or ammonia; but there must be one of each kind. Fat will not dissolve in water; but when previously combined with alkali, it readily dissolves, and the three together form the well-known lather or suds. So much for the soap, then; but still this does not explain the action of soap in washing. The skin and the linen, when dirty, have always a certain amount of greasiness, which water will not remove, because it has so little affinity for greasy or oily substances; but if a little soda or potash be used, this at once forms a compound, a soap, with the grease, and the newly-formed soap becomes soluble in water. Every person who washes his hands with the aid of a bit of soda, becomes a soap-maker at that instant, without being conscious of his dignity. If soda or potash alone were used in washing, the caustic action of the alkali would corrode the skin and burn or destroy the linen; and it is on this account that soap is made previously. The alkali is the real detergent or washing agent, while the oil or tallow softens and mellows the causticity. All soap is made with less fat than will fully saturate the alkali, so that the latter still retains power enough to saponify the grease upon which it is required to act. When soap and soft water, then, are used in washing, the alkali of the soap combines with the grease or dirt to form a still richer soap, which becomes easily soluble in the water; but when the water is hardened by containing sulphate of lime—which is the case with much of our spring-water—a perplexity arises. The sulphuric acid of the sulphate has a strong affinity for the alkali of the soap; the two unite to form sulphate of soda or of potash, while the lime of the one and the fat of the other, having nothing else to do, unite to form the curd; so that the soap becomes no soap, and the washing can only be half effected. But though the enemy cannot be conquered, he can be neutralised: throw in a little more alkali, in the familiar forms of soda or potash, and the acid of the sulphate, feasting on this spare alkali, will leave the soap to do its own work in its own way. Perhaps this little bit of chemistry will suffice to shew the philosophy of hard water in washing.

In the much-entangled question respecting the supply of water to the metropolis, many of the reasonings have been founded on the fact, that Thames water contains rather a large percentage of lime, and is to that extent hard. Some of the well-water is still harder; but the water from the surface-drainage of wide districts like Bagshot, is found to be much softer; and some of the recent plans have been based on this

* Since this article was in type, we have learned that a modified version of it has recently appeared in a religious periodical, to which it was sent by the author a year ago.—*Ed. C. E. J.*

fact. The laundress is closely interested in this question. Some attention was excited about three years ago by an estimate from Mr Bullar, that the washing-bills of the metropolis reach £5,000,000 annually; that is, that the actual cost of washing clothes amounts to this vast sum. The estimate was the result of five or six years' investigation. Mr Bullar inquired of labouring-men and their families; of the superintendents of the various public wash-houses; of single men in the humbler grades of life; of small tradesmen and shopkeepers; of servants in wealthier families; and of the wealthier families themselves; and grouping society into classes, and putting down a certain average per head to each, he arrived at the above result in round numbers. The numbers are given with a full acknowledgment of the difficulty, if not impossibility, of obtaining a correct result; but, like many other estimates, this may be useful until a better is obtained. The soap-and-water question thus rises to one of some magnitude.

Professor Clark has adduced a remarkable fact, illustrative of the wear and tear of linen by the use of hard water. Two young men, brothers, in Glasgow, were put into counting-houses, one in London, and the other in Glasgow. They had a similar assortment of shirts given to each. Some time after, when the brother in London came back on a visit to Glasgow, the lady of the house pointed out, to the wonder of her female friends, the difference observable in the wear of the shirts of the two brothers; those that had undergone the London washing being so much more worn than the others which had been washed at Glasgow. So far as regards the soot or 'blacks' resulting from factories and ironworks, and dwellings in a district where coals are cheap, it is not improbable that linen becomes soiled by the air of Glasgow quite as much as by that of London; indeed, Professor Clark places it before London in this respect. The truth of the matter is, that so much soda and pearl-ash are required to neutralise the lime in London water, that textile materials suffer thereby.

Thirty pounds of soap are consumed by every 100 gallons of Thames water, before it forms a lather fitted for detergent purposes. So says Dr Lyon Playfair; and a serious statement it is. According to competent authorities, the soap consumed in Great Britain averages about seven and a half pounds per head per annum, which, at 50s. per hundredweight, or £5.00 per ton, would give about 3s. 4d. for each person. The London consumption is estimated at double this average, or fifteen pounds per head; about 1000 tons of soap per month, and 250 tons of soda additional for washing alone, costing altogether about £630,000 per annum for soap and soda for washing in the metropolis alone. What portion of this is absorbed by the lime which so unluckily finds a home in Thames water, we could not know, unless it were known how much Thames water is used annually for detergent purposes; but it must amount to a pretty severe water-rate, which Father Thames will not remit.

So close are the links of the social chain, that even a basin of water may affect both the ethics and the esthetics of the multitude, when the basin is multiplied by millions. Thoughtful men have built up a structure of reasoning by the following steps: Thames water (taking this as an example) contains more lime, irrespective of impurities, than is desirable; it is hard; it requires much soap and soda to make it wash well; this soda injures the clothes, and the additional soap is expensive; this expense tends to discourage the washing of clothes among poor families; this discouragement tends to the use of dark colours in dresses, as a means of concealing dirt; and this concealment by means of a dusky hue cannot fail to have some effect, however slight, on the decent self-respect of the wearers, and of the popular taste in regard to colours in dress. An opinion has been expressed, that if manufacturers, who

supply on a large scale the materials for women's and children's dresses, were to watch attentively the districts in which the various kinds command a ready sale, they would probably find that, other things being equal, the dark colours would sell most in districts supplied with hard water; the brighter colours being disposed of more readily in the soft-water districts. We do not know whether any of the great firms in Manchester or Glasgow are in a position to throw light on this very curious and not unimportant subject.

Washing, whether of the person or of the garments, is by no means the only process in which the relative hardness and softness of water is an important question. In all operations where water is to act as a solvent, or to draw out the qualities of animal and vegetable substances, the agent must be free, to do its work well; and with lime, &c., present, water is *not* a free agent; it performs its chemical functions only so far as its hard companion permits it so to do. Whenever opportunity has been afforded for making the inquiry, it has generally been found that housewives and manufacturers like soft water better than hard: the one for domestic, and the other for factory purposes. Some few years ago, the Stockport Water-works Company began to supply two kinds of water—the first having a degree of hardness about equal to that of Thames water, and the second being much softer. The soft water came into very general favour: it was voted better for washing, as it used less soap; it was better for tea, as it used less of the costly leaf; it was better for brewing, as it drew out the malt extract more effectively; it was better for steam-engines, as it did not corrode the boilers so quickly. A bleacher of Stockport told Dr Sutherland, that 45 pounds of alkali with the soft water has as much bleaching effect as 50 pounds with the harder water; and that the saving of soap is in still larger proportion. A calico-printer said, that the soft water requires less dye-drugs to produce the desired intensity of tint.

In a manufacturing district, the steam-boiler question is of much importance; for there is now an accumulation of evidence, that the boilers become incrusted much sooner by the use of hard than soft water: the chemical theory of the subject shews that this would probably be the case, but still it is necessary to test it by facts. At Blackburn, as at Stockport, the town has recently been supplied with water nearly soft, instead of a much harder water, derived from brooks near the town; and the engineers have found that they save more than the amount of the water-rate, by the lessening of expense in repairing and cleaning steam-boilers. Warrington, in like manner, has its two kinds of water; and the brewers have, by pretty general consent, abandoned the hard for the soft.

As the tea-question is one that comes home to every one's pocket in England, we must notice it. Mr Philip Holland, a surgeon, who has the usual laboratory aids for testing and purifying water, has stated, that the Lambeth Company's water, formerly derived from the Thames, near Waterloo Bridge, but now from a higher and purer part of the same river—used to be very hard, foul, disagreeable, and unwholesome; and that, as a matter of economy as well as of health, he used to add a little oxalate of ammonia to the water whenever tea was made; the consequence was, that ten ounces of tea went as far as eighteen ounces had before gone. He states, that one pennyworth of the oxalate would suffice to precipitate the lime in ten gallons of Thames water. It would not be fair to draw inferences unfavourable to the London water companies from such a fact as this, for the whole of them have now abandoned the obtaining of water from the Thames, except at some distance from London, but still the principle is the same.

Mr Webster, in his *Encyclopaedia of Domestic Economy*, thus sums up his views concerning the water best fitted for cooking:—'In culinary operations, where the object

is to soften the texture of animal or vegetable matter, or to extract from it, and present in a liquid form, some of its soluble parts, soft water is the most effective, and to be preferred. In brewing, boiling, or stewing meat, making soup, or any extract whatever, soft water is best. But if we consider the cooking of vegetables, we shall find that in some instances hard water is better than soft; and this the cook knows, practically at least, by throwing salt into the water, which makes it hard. Soft water without salt has too powerful a dissolving effect upon green vegetables; it makes them too tender, destroying that firmness essential to the preservation of their juices, which are thus dissolved and extracted, and the vegetables consequently rendered insipid, at least to English palates. Together with the juices, the green colour is extracted, and the vegetables rendered pale, and even yellowish. In boiling fish, likewise—the contrary to boiling meat—it is not required merely to render the fish soft, but to preserve a certain degree of its firmness; salt is therefore put into the water in boiling fish; hence it is evident that, in this case, hard water is at least as good as soft, if not better. It may, therefore, be laid down as a rule in domestic economy, that when the object is to dissolve substances, to render them soft, or to extract the virtues of anything, as in soups, broths, stews, &c., then soft water is the best; but when the object is to cook the food by preserving the juices as much as possible, hard water is preferable. This, it is to be remarked, although correct, is not the prevailing opinion derived from books on cookery.'

This concluding remark looks very much as if doctors differ in the saucepan as elsewhere. Certain it is, that hard water is treated a little more gently by Mr Webster, a laboratory cook, than by kitchen-cooks generally. The magic-stove making, nectar-brewing, gastronomic M. Soyer, who has acquired something more than the ordinary fame which belongs to good cooks, has brought his knowledge to bear on this subject, as on all others connected with the culinary art. He tells us that Thames water is too hard for cooking; that if cabbage, greens, spinach, or asparagus, be boiled in it, they acquire a yellow tinge; that French beans are still more discoloured; that peas and beans have a tendency to shrivel up; that the boiling requires a longer time; and that it is desirable to add a little soda to the water, to soften it.

M. Soyer conducted a remarkable series of experiments in 1850, at the suggestion of the Board of Health. The object was to ascertain what influence the quality of the water exerts on the infusion of tea; or, as we familiarly term it, on making tea. He procured distilled water from Apothecaries' Hall; water from an Artesian well in Covent-garden Market; water from an Artesian well, 360 feet deep, at the Reform-Club-house; water from a well, 200 feet deep, at the Camden Station; New River water; water from a spring in Wellclose Square; water from a well at Camberwell; Thames water; and water rendered artificially hard by three different proportions of lime. He procured green tea, black tea, and mixed tea, and made infusions of each of the three kinds in each of the eleven kinds of water. He found that the distilled water gave the extract more quickly than any other; indeed, almost too quickly, for it drew out also a little of the woody flavour, which is not wanted. The water from the deep well at the Reform Club-house, though ranking second in rapidity of action, is placed by him in the first rank as regards tea-making qualities. Not only does hard water require a longer time than soft to extract the quality of the leaf, but there is a percentage which it seems to leave wholly unextracted. M. Soyer asserts, that with Thames water it requires one-third more tea to produce a given quantity and strength of extract, than if pure soft water were used—an assertion which, if true, points to an enormous annual waste, of a somewhat

costly article, among the million or so of tea-drinkers in the metropolis.

Meat, M. Soyer says, seems to be influenced much in the same way as vegetables, by boiling in hard water; that is, the characteristic qualities are not developed or drawn out as they ought to be. Hard water seems to compress the pores; while soft water dilates them, and acts upon the succulent matter which they contain, making them more nutritious. In boiling salt-meat, our great authority tells us, 'less salt is extracted when boiled in hard water, and at the same time the meat is not so tender as when boiled in soft water. Soft water evaporates one-third faster than hard water.'

But what of water as a drink *per se*? Dr Leech, a medical practitioner of Glasgow, made a statement before the Board of Health in 1850, which, if correct, is of considerable importance:—' During the late cholera, there was a remarkable circumstance which deserves notice, as compared with the epidemic of 1832. Since the former period, the population of Glasgow south of the Clyde has nearly doubled; and with this exception, and the introduction of the soft-water supply (by the Gorbals Gravitation Water-works), the circumstances might be considered as the same at both periods. In 1832, in one district—the parish of Gorbals—the attack was fearful; while Glasgow north of the Clyde also suffered severely. During the late epidemic, Gorbals parish furnished comparatively a small number of cases, while the epidemic in other parts of Glasgow was very severe. The unanimous opinion of the medical society was, that this comparative immunity was to be attributed to the soft-water supply.' In confirmation of this tendency in hard water to encourage cholera more extensively than soft, Dr Paton has stated that in Charleston, a district of Paisley, standing higher and possessing purer air than most of the town, and supplied with water from wells and not by the company, cholera made its most severe attack, hardly missing a family, except a few who were supplied with soft water. In respect to fever, also, the Local Board of Health in Paisley found that in the district supplied with well-water, fever prevailed in more than tenfold ratio, as compared with the district supplied from the water-works, of which the water is obtained from hills of considerable height a few miles from the town. Nothing surely can be more worthy of attention than such statements as these; running streams of clean water, and vessels plentifully filled with it, are blessings to the inhabitants of a closely-built town; but if disease follows some kinds of clean water, the wide world ought to know it.

Cisterns and water-butts are in much disfavour with medical men. There is an increasing use of the pressure or constant-supply system; that is, a system whereby the water is driven from the water-works with such force as to keep all the pipes, great and small, always full. Dr Hassell, one of the medical witnesses examined by the Board of Health, has pointed out that the water in a cistern is generally exposed to light, air, the sun, and the reception of dead and living organic matter. This organic matter, with dirt and dust of various kinds, forms an ever-increasing mass, which is stirred up every time the water comes in, only to subside again when it is quiescent. Cisterns and water-butts are often placed in rather inaccessible positions, and cannot be reached without ladders or other troublesome contrivances; this, and the well-known tendency to postpone as long as possible all house repairs and disagreeable house cleansings, lead too often to an unsightly and unwholesome state of the water-supply, over and above the defects which may exist in the water from other causes.

We are a much clothes-washing, much tea-drinking, much meat-eating people; and when our sanitary friends thus tell us how largely the good-fortunes of

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the clothes and the tea and the meat depend on the quality of the water, it will be a little too bad if we do not bear in mind the fact—supposing it to be supported by wider experience—in our future practical operations for water-supply.

THE MASTODON.

AMERICA has long been famous for its mammoths; and we have now before us a handsome quarto,* in which the story of the monster creatures is told with such particulars as shew that the fame has substantial grounds to rest upon. The volume itself, which is highly creditable to the author, affords a favourable view of the advancement of palaeontological science in the United States; and we purpose, while calling attention to it, to gather a summary of the interesting facts which it contains.

The first mention of mammoth bones in America occurs in a letter written by the Rev. Cotton Mather to Dr Woodward, secretary of the Royal Society in 1712. The devout writer was describing a manuscript work of two folio volumes, in which some painstaking colonial author had declared, that the statements concerning giants in the book of Genesis were fully verified by the discovery of certain big bones, evidently human, not far from Albany. These had been found in 1705, and others were subsequently picked up near the same locality on the banks of the Hudson. Among them was a tooth of five poundweights, and another with fangs six inches in length, described as being singularly like the eyetooth of a man. The learned colonist may be pardoned for believing he had found a fossil antediluvian, seeing that in his day witchcraft was a fact to millions, and mankind generally had not made up their minds that the earth spins round the sun.

Since that time, bones, teeth, and skeletons, more or less perfect, have been found in different parts of the world and through all degrees of climate—in France, Switzerland, on the slopes of the Himalaya, on the banks of the Irrawadi, and in America. From the specimens brought to light, the number of species is now reckoned as twenty-three, with a subdivision including four others, all based chiefly on differences in the structure of the teeth. Numerous as the discoveries have been in America, it is remarkable that, except in a single instance, none of the remains have been met with east of the Hudson River, while they occur in all the other states down to the Isthmus and as far west as Oregon. A vertebra and two teeth are all that have ever been found in New England, and yet they are seen again in Canada; so there was probably some local cause, apart from that of climate, which kept them out of the part of the country referred to.

In 1740, De Longueil, a Frenchman, came upon some large bones at the Salt Lick, in Ohio, which seemed to him of such importance, that he sent them to Paris, where they were carefully examined and commented on by the *savants*. Naturalists took up the subject, but without any attempt, so far as is known, to prove that the bones were human. At length, in 1801, two nearly entire skeletons were found near the Hudson; and in 1840, Koch discovered the famous deposit in Missouri, from which was obtained the skeleton now in the British Museum. Meanwhile, Cuvier had been the first to give a scientific description of the huge creature, for which he proposed the name *Mastodon*, from two Greek words signifying *nipple-tooth*, adding the distinctive term *giganteus*. Those who have seen the teeth, will remember the conical protuberances on the upper surface of the grinders.

The state of New Jersey is rich in fossils; one of its small rivers, the Wallkill, is called the Mastodon

stream. In October 1844, portions of five skeletons were found at Hackettstown, about twenty miles from Newark: most of the bones, however, except those connected with the jaw, crumbled away on exposure to the air. One set was particularly interesting, as they were those of a young or calf mastodon, and they have been of signal use in enabling the learned to trace the natural history of the animal from the earlier periods of its growth. These skeletons were found in a ravine-like depression in a hilly ridge, where a swampy patch had been dried by the heat of the sun. All but one were in a standing position, as though imbedded by a sudden overflow—some at a depth of six feet, others but little below the surface. In digging down, a layer of vegetable mould and sand was first passed through; the next was a yellowish stratum, which, as the discoverer said, 'resembled and smelt like the matter of a cow-yard'; and besides this, there was found among the bones a quantity of stuff which he took to be 'coarse chopped straw and bits of stick.' All these were indications that the animals had been buried at a comparatively recent date.

In the following year, another discovery was made. Orange County, on the west of the Hudson River, about seventy miles above New York, appears to have been a favourite resort of the mammoth; it was there that the two skeletons above mentioned had been found in 1801. The summers of 1844 and 1845 were unusually dry, and many small collections of water entirely disappeared; lakes became swamps, and swamps dry ground. The farmers took advantage of the event, and dug up the soft mud from the hollows, and used it as manure. Mr Brewster, whose farm is situated a few miles from Newburgh, was digging at the bottom of a small valley; and at three feet below the surface he came upon a bed of shell-marl, into which the diggers had penetrated about a foot, when a hard mass was struck by the spade. 'A rock!' cried some; 'A mammoth!' cried others jestingly. An examination took place, and the supposed rock was found to be bone. Considerable eagerness was then manifested to explore further; the digging was carefully continued, and presently the skull and long white tusks of a mastodon lay exposed to the wondering gaze of a hundred spectators, who, as the Newburgh turnpike-road lay but a few yards from the spot, had all stopped on their journey to see the sight. The top of the skull was about five feet below the surface, and its position afforded a clue to the direction in which the other portions of the skeleton might be looked for. The diggers continued their task; it was slow work to disinter such a monster, yet by the end of the second day, nearly every bone had been discovered, to the great delight of the whole party.

In the hollow formed by the cavity of the ribs, lay a mass of about five or six bushels of broken twigs, rushes, leaves, and earthy matter; the coarse-chopped straw and bits of stick of the New Jersey farmer. The pieces of wood varied from the smallest sized twig up to half an inch in diameter, and averaged two inches in length, with evident signs of having been crushed, but not ground, by great pressure. Maple, lime, and willow were, as was thought, discovered among these fragments; but one conclusion might safely be entertained, which was, that the heap had once been the contents of the mastodon's stomach, and constituted what Professor Hitchcock called his last supper. The conclusion was strengthened by a train of the same material, about four inches diameter, extending from the stomach towards the tail, where, beyond the bones, lay a homogeneous mass evidently faecal. This would have been closely and carefully examined, but the sides of the excavation fell in on the second night, and the materials were so deeply buried and intermingled with the soil, that further search had to be abandoned. All the bones, however, were obtained, excepting the toe-bones

* *The Mastodon Giganteus of North America.* By J. C. Warren, M.D. Boston. 1832.

of the left hind-foot. One of the tusks was broken in two in lifting it from the ground; their length was ten feet eleven inches, and seven and a half inches diameter at the base—dimensions truly prodigious, and conveying marvellous ideas of the creatures that carried such appendages. From the fact of the fore-legs having been found stretched out in front of the skeleton, it was supposed that the animal had sunk in swampy ground, and floundered laboriously to extricate itself, as is the case at times with the hippopotamus of the present day; but not succeeding, it had died of starvation on the spot, and was gradually buried by natural causes, operating through a series of years. For a few months after its discovery, this skeleton was exhibited in New York, and other towns of the United States; it ultimately became the property by purchase of Dr Warren, who had it properly articulated; and it is now set up in a fire-proof building at Boston, where many American and British naturalists have had opportunity for examining it. There is another almost perfect skeleton in the museum at Cambridge, Massachusetts. Of the five skeletons now standing in different museums, four were discovered in Orange County.

This last disinterment gives us a somewhat startling peep into the antediluvian world. We find not only the skeleton of an extinct quadruped, but also the remains of what he lived on; and the mind is bewildered in contemplating the huge form in which animal life presented itself in past ages, and in having it brought, as it were, so near to us. An examination of the marl in which the bones were found, shews it to contain land and fresh water shells identical with species now in existence. Dr Carpenter, among others, has examined the 'bits of stick' with the microscope, and finds them to belong to some coniferous tree or shrub which still grows in America. Thus we have an important link between the life of the present and that of the past. Rushes formed part of the food as well as branches; and we may believe, that when the mastodon found the wood too dry, he betook himself to the bogs and swamps in search of moister food, where, sinking by his enormous weight, he was unable to get out again.

Dr Warren gives a detailed and methodical description of the several skeletons that have come under his notice, comparing one with the other in structure and dimensions; and on many points he has cleared up doubts, and added to our knowledge. The number of teeth supplied to the mastodon was long a matter of uncertainty, and it was often a question whether an animal that lived on such tough food did not wear out his teeth long before he ceased to need them. We now know, as might have been predicted with certainty, that efficient masticating power was fully provided for in the huge quadruped's economy. The whole number of teeth comprised six on each side in each jaw: first came the two small anterior milk molars; the third, also small, with six points or nipples; the fourth, a larger of the same kind; followed by the fifth, still larger, at a late period of life; and last, the sixth, 'the great ultimate four or five ridged tooth, with its eight or ten points, which takes the place of all the others, and remains the solitary tooth of its side, to be retained by the animal, so far as we know, during the remainder of its life.' These last mentioned are the finest examples we possess of nature's handiwork in the way of teeth; indeed, they may be called superb; and their composition and structure are superior to those of any of the present races of animals. Thus provided, the mastodon might have enjoyed himself for four or five centuries, secure of life as long as he had strength to move his jaws.

The tusks are incisor teeth enormously developed; the first pair, as shewn by the calf found near Hackettstown, fell out, and left room for their permanent successors. The dimensions of these have been already

stated: they are formed of a succession of laminae, composed of phosphate and carbonate of lime, calcium, magnesia, soda, and sulphur. Besides these, there was a pair of inferior or mandibular tusks in the lower jaw, one of which yet remains in the skeleton described by Dr Warren; it is eleven inches in length, and the cavity for its fellow is still seen on the opposite side of the jaw. This lower tusk is never found in the elephant genus; it therefore constitutes a distinct and marked difference between that and the mastodon.

In comparing the two, the elephant is seen to be taller, lighter, and more adapted for movement than the mastodon; while the latter is built for slow motion, to bear great weights, and move heavy masses, and conveys an idea of far more gigantic proportions. Its longest rib-bone measures fifty-five inches in length, and the bones of the fore-feet are two feet across. What a foot must that have been when covered with muscle, skin, and hair! Some parts of the skeleton bear a greater resemblance to certain bones of the human body than to those of any other quadruped; which fact may perhaps excuse their having been taken for those of giants. The Siberian mammoth—a Tatar name, meaning of the earth—is supposed by many persons to be the same as the mastodon; but it is in reality an elephant, the *Elephas primigenius*, as shewn by the difference of structure, and the absence of tusks in the lower jaw. Numbers of these animals have been found frozen up in sand-banks, retaining all their flesh and original form almost unchanged.

The period at which the mastodon ranged the earth, is an interesting question with geologists. The temperate zone of America appears to have been its chief habitat; its remains have been found on the north-west coast of that continent, as far north as sixty-five degrees; and Mr Darwin met with them in Patagonia, and other parts of the south. We may consider it as settled, that the creatures lived at the time the Alps and Caucasian chains were being upheaved, about the middle of the tertiary period; when the northern ice was confined to the arctic circle; when the great valleys of Switzerland and of the Danube were seas, forming offshoots from the Black Sea and the Caspian; when the volcanoes of France and Germany were in full operation, and an outbreak of molten matter created Staffa and the Giant's Causeway. That was the age of pachyderms; and the mastodon is supposed to have been a link between the deinotherium and the elephant.

The European mastodon was in existence at an earlier period than that of America; the bones of the *Mastodon angustidens* have been found in France in calcareous rock fifty feet below the surface; while the remains of the *Mastodon giganteus* of the western hemisphere, 'have generally been discovered in post-tertiary or alluvial formation, at the depth of from five to ten feet in lacustrine deposits, in bogs, or shell-marl.' The elephant period is believed to have been the same in both continents, though it was stated by M. Desor, at the late meeting of the Swiss Society, that the elephant preceded the glacial period in Switzerland, but followed it in America, the species, however, being the same. It appears certain that the *Elephas primigenius* and mastodon were both in existence at the same time.

Negative evidence of some value is found in the fact, that in the most ancient sculptures of which we have any knowledge, there is no representation whatever of the mastodon. This, notwithstanding the arguments to the contrary, would assign the animals to a period anterior to the creation of man. A long-continued series of observations on the time required for the deposition of marl, and other superficial strata, would furnish some clue to the period in which the bones were imbedded. Sir Charles Lyell, who has bestowed much attention on the subject, and examined the localities in which the bones have been found, says, that the mastodons of America 'lived after the deposition of

the northern drift, and, consequently, the coldness of climate which probably coincided in date with the transportation of the drift was not, as some pretend, the cause of their extinction.' And his opinion is, 'that the disappearance of the mastodon, and many other megatheroid animals, occurred at a period not very long anterior to the introduction of man.'

The cause of disappearance remains uncertain, and is the more difficult to explain, because the climate and vegetation appear not to have been greatly different from the present. Individual deaths can be accounted for, but not the destruction of a whole race. Whether there was any process of extirpation similar to those taking place in our day, is a question which will tax the ingenuity of philosophers for some time longer.

THE LIFE AND POETRY OF EDGAR POE.

AMONG the results of that spirit of enterprise which has brought us into intimate connection with the other nations of the earth, a more extended knowledge of literature is certainly not the least interesting. The triumphs of science and human energy, which have done so much to change our ideas of distance, and to give us ample opportunities of becoming acquainted with the remote portions of the world, have had an effect in widening the circle of readers to such a degree, that authors may now be said to write, not for those of their own country merely, but for a world-wide public. This is especially the case in regard to those who, though separated from us by the mighty ocean, use the same language, and give expression to ideas very similar to our own. The extent to which our knowledge of American literature has increased within the last few years, is one of the most striking illustrations that could be adduced of the manner in which free communication between nation and nation contributes to the general diffusion of enlightenment, and the cultivation of an elevated taste. As may easily be supposed, our transatlantic cousins have hitherto profited most by these benefits. Their literature and art are little else as yet than reflections of our own; but we have, nevertheless, obtained some return for what they have derived from us, in the works of the more recent American authors—works which are now beginning to exhibit greater originality, and indicate the formation of what will in course of time be worthy of being considered a national literature. The poets and novelists are leading the van in this intellectual progress; for it is obvious that the specimens of American poetry with which we are now more or less familiar, evince a far higher order of genius, and more remarkable characteristics of originality, than anything of the kind which the poets of the New World formerly produced. They are distinguished by a greater degree of freshness, by a more delicate sense of the beautiful, and a higher tone of feeling; and although a great poem, in the true sense of the term, has not yet reached us from the other side of the Atlantic, not a few remarkable ones may now be pointed to in the works of such men as Longfellow, Bryant, Lowell, Whittier, and Poe. While the first two of these are now nearly as familiar to the lovers of poetry among us as they are in their own country, the others, equally worthy of notice, are by no means so well known as they deserve to be. Poe, as a writer of more than ordinary power, and as one who has evinced far more originality than any of his contemporaries, is especially worthy of

attention; and we therefore propose, in the course of this article, to present our readers with an outline of his strange, sad history, and a few selections from such of his poems as are most remarkable.

Three volumes of poems, tales, essays, and criticisms, recently collected and published in America, contain the contributions of Edgar Allan Poe to the periodical literature of his country, and form the sole basis upon which his reputation as a writer rests. Very recently, his poems alone have been republished in England, with a brief prefatory essay, in which his merits as a prose-writer are scarcely even referred to, while the moral of his life is obviously mistaken. From a biography prefixed to the New York edition, we are enabled to form an estimate of his personal character, such as his works do not afford; and we doubt if the records of human wretchedness and frailty can yield anything more painful, than the facts upon which that estimate is founded. Mental philosophy will scarcely enable us to account for the consistency of a fine sense of the beautiful, both in physics and morals, with an extreme practical demoralisation; but that it did exist in the case before us, as in many others, there is no room to doubt; for never, we believe, was genius allied to vice in its grosser forms more apparent than in the career of Edgar Poe. Unhappily, circumstances of the most unfavourable kind surrounded him at his very birth, for both his parents died while he was a mere child, leaving him little else than the dangerous inheritance of strong passions and a restless disposition. His lot, in a worldly point of view, was by no means a hard one, however, for at his father's death he was adopted by a gentleman of ample means and a kindly heart, who strove with true paternal solicitude to guide and control the wayward boy. His efforts were unavailing; for no sooner had Poe returned from England, where he had been taken by his foster-father for the purpose of obtaining the advantages of a liberal education, than he entered upon the course of recklessness and dissipation which ended only with his life. Expelled from an American university, he returned home to repay his guardian's kindness with insults and ingratitude of the worst description, and subsequently set forth on a Quixotic journey to join the Greeks in their struggle for independence. Greece he never reached, however, but was picked up a wandering beggar in Russia, and sent back only to be cashiered from a military establishment into which he had been admitted by influence of no ordinary kind.

We next hear of him as a private soldier, then as the successful competitor for a prize offered by an enterprising publisher for a tale and poem, and again as a miserable and half-famished writer for obscure periodicals. Poe's genius was not such as to remain long in obscurity, and accordingly his writings speedily brought him into notice, and procured him lucrative and honourable employment. For a time he seemed to have overcome his evil propensities, and to have resolved upon a new course of life. He married a young, beautiful, and gentle wife—*'The Beautiful Annabel Lee'* of his touching and exquisite lyric. He surrounded his home with all those refinements which a highly-cultivated taste could suggest and a moderate income allow. In his humble yet poetical home, he appeared to those who knew him best to have begun that career of high endeavour for which his genius was so well fitted, and to have entered upon a course which

would soon lead to fame and fortune. A few months, however, and all this was at an end. His employers were compelled, reluctantly it is believed, to free themselves from a connection with one whose power they appreciated, but whose irregularities and apparent insanity were continually the source not only of annoyance, but of great pecuniary risk; for Poe's antipathies, always violent, were rendered tenfold more so by intemperance, and he seldom scrupled as to the means of giving expression to them. After continued periods of dissipation, intervals of sobriety and great labour occurred. There were times of remorse, and often of brilliant achievement. Let no one deem such language misplaced in the case of one who was as yet only a writer of fugitive papers for ordinary periodicals. The periodicalism of America has fostered all its best writers; and there, not less than with us, do we find the highest evidences of intellectual strength in what is designed to last only for a few days. The nature of many of Poe's contributions was, however, enduring; they bore the impress of genius; and twenty years hence, the best of them will probably be much more familiar to English readers than they are now. These were thrown off with amazing rapidity, considering their character, at a time when, after his settlement in New York, all who admired them, and were interested in their author, deemed that he had entered upon a new and purer course of life.

This hopeful period, however, was soon at an end. In two years after, his wife, whom he seems to have really loved, died in abject penury, and he had once more plunged into the wildest excesses. Desperately dejected, reckless, and mad, he still, at intervals, astonished his countrymen with some new proof of his genius. The literary circles of New York were always open to him in his sober hours; and even in his worst days, he lacked not the self-sacrificing devotedness of woman. The mother of his dead wife clung to him, hoping against hope, caring for him, screening him, and, amid all his self-abandonment, watching over and seeking help for him. Occasionally it would seem as if this tenderness and solicitude had brought back Poe to a sense of shame. He again turned earnestly to his pen; and in 1848, produced *Eureka*, a work to the composition of which he brought his capacities obviously in their most complete development. It is a prose poem on the cosmogony of the universe, a work of rare power, and the effect of which in America was beyond anything that had been experienced for years. It greatly increased the number of Poe's admirers, among whom was a lady spoken of by his biographer, as 'one of the most brilliant women in New England.' Whether from sufficient cause or not, the name of this lady and that of the admired but wretched poet were frequently associated, and it was hoped that their expected union might have a beneficial influence upon his character. This, however, did not take place—Poe, in a fit of almost incomprehensible brutality, having obtruded himself, designedly it was thought, upon a circle of her friends, and in her own presence, in a state of wild inebriety. Another, and the last, temporary reformation followed this occurrence. He once more gave evidence of a determination of amendment—spoke with unaffected horror of his past life, and became jealous of seduction into his former courses. Temptation assailed him, however, at an unguarded moment, while on his way to accept of an honourable invitation from a literary institute, and he fell never again to rise. After days of dissipation and madness, he died in the public hospital of Baltimore, in October 1849, at the early age of thirty-eight.

The moral of this melancholy history lies upon the surface. Dark sometimes, dreadfully dark as is the page on which are written the records of genius, we know of nothing more sad and painful than this, for never, we believe, was the poetic gift allied with so

much that was essentially depraved. It is more than doubtful whether the daring recklessness, the wild licence with which men like Poe sported with the responsibilities of life, have not done far more for Satan, than in their highest and purest works they have done for man. And yet the poetry of this poor inebriate is free from aught of that viciousness which marked his life; for the most part, it is the mournful wail of one whose natural endowments were never called into play without uttering unconsciously deep and touching sorrow over the wreck of the spirit of which they formed a part. It is the sad dirge-like music of those moments which were pauses in a lawless life—a strain in which the agony of remorse seems to thrill with all its intensity, or to grasp at strange quaint fancies, and force them to interpret things it dare not distinctly utter. And thus much that Poe has written, is auto-biographical in a stricter sense than poetry of a strongly subjective character generally is. Draped in the sombre or the flaming garments with which his imagination invested them, we see the poet himself, and all his mocking or upbraiding thoughts, wandering wildly through the melancholy numbers. There is a deep and beautiful tenderness, too, in some of his lyrics, as witness the exquisite poem of *Annabel Lee*—the expression of his sorrow for the death of his gentle wife.

It was many and many a year ago,
In a kingdom by the sea,
That a maiden there lived, whom you may know
By the name of Annabel Lee;
And this maiden she lived with no other thought
Than to love and be loved by me.

I was a child, and she was a child,
In this kingdom by the sea,
But we loved with a love that was more than love,
I and my Annabel Lee—
With a love that the winged seraphs of heaven
Coveted her and me.

And this was the reason that, long ago,
In this kingdom by the sea,
A wind blew out of a cloud, chilling
My beautiful Annabel Lee;
So that her high-born kinsmen came
And bore her away from me,
To shut her up in a sepulchre,
In this kingdom by the sea.

But the moon never beams, without bringing me
dreams
Of the beautiful Annabel Lee;
And the stars never rise, but I feel the bright eyes
Of the beautiful Annabel Lee.
And so, all the night-tide, I lie down by the side
Of my darling—my darling—my life and my bride,
In the sepulchre there by the sea—
In her tomb by the sounding sea.

This strain of sorrow is only equalled by those in which the poet mourns over the wreck of his wasted life. Amid all his wild excesses, and his self-outlawry from the amenities of social existence, he had no more severe censor than that which spoke from within his own soul. This is strikingly manifest in the poem, entitled *The Haunted Palace*, and especially in the following stanzas of it:—

In the greenest of our valleys,
By good angels tenanted,
Once a fair and stately palace—
Radiant palace—reared its head;
In the monarch Thought's dominions,
It stood there.
Never seraph spread a pinion
Over fabric half so fair.
* * * *

But evil things, in robes of sorrow,
Assailed the monarch's high estate;
Ah, let us mourn! for never morrow
Shall dawn upon him desolate!
And round about his home the glory
That blushed and bloomed,
Is but a dim-remembered story
Of the old time entombed.

And travellers, now, within that valley,
Through the red-litten windows see
Vast forms, that move fantastically,
To a discordant melody;
While, like a ghastly rapid river,
Through the pale door,
A hideous throng rush out for ever,
And laugh, but smile no more.

While Poe's genius was necessarily infected by the depravity of his life to the extent of a misanthropical faithlessness in man, his poetry, from the circumstance of its being so strictly subjective, is less unhealthy than his prose. The utterance of his own self-knowledge is, moreover, always too passionate to be deemed sincere. His tales and sketches are often pervaded by the horrible, to an extent which is only saved from being repulsive by the power of imagination and the strength of the reasoning faculty displayed in them; but in his poems there are almost always glimpses afforded of a ruined beauty, and an analytic treatment of emotion, sufficient to give them a moral tone. He seems, as it were, to have preserved the latter sacred to the expression of his own sorrow, for that the phantom of the past rose up before him with awful, soul-subduing severity is clear, we think, from many of his best poems. *The Raven* is the most remarkable proof of this; and when we know that it was written during what might be considered the longest of those periods of sober earnestness, strong thought, and incessant labour which occurred in his brief career, we are at no loss to discover, that what seems fanciful and almost amusing to the ordinary reader, had a deep and terrible significance to the unhappy poet. This remarkable poem, which occupies, we think, the most prominent position among the originalities of American imaginative literature, is much too long to be quoted by us in its entirety, and not a little of its peculiar charm is necessarily lost by its unity of strong emotion being broken up. Suffice it to give a mere outline of the poet's reverie broken by the tapping at his chamber door, and the subsequent colloquy with the 'stately Raven of the saintly days of yore'—a meet emblem of the dark shadow of his own worse than wasted life which conscience summons up before him.

Then this ebony bird beguiling my sad fancy into smiling,
By the grave and stern decorum of the countenance it
wore;
'Though thy crest be shorn and shaven, thou,' I said, 'art
sure no craven,
Ghastly grim and ancient Raven, wandering from the
nightly shore—
Tell me what thy lordly name is on the night's Plutonian
shore?'

Quoth the Raven: 'Never more.'

* * * *

But the Raven sitting lonely on that placid bust, spoke
only
That one word, as if his soul in that one word he did
outpour—
Nothing further then he uttered; not a feather then he
fluttered;
Till I scarcely more than muttered: 'Other friends have
flown before:
On the morrow he will leave me, as my hopes have done
before.'

Then the bird said: 'Never more.'

Startled at the stillness broken by reply so aptly spoken—
'Doubtless,' said I, 'what it utters is its only stock and
store,
Caught from some unhappy master, whom unmerciful
disaster
Followed fast and followed faster, till his songs one burden
bore—
Till the dirges of his hope that melancholy burden bore,
Of—Never, never more.'

* * * *

'Prophet,' said I, 'king of evil—prophet still, if bird or
devil!
By that heaven that bends above us—by that God we
both adore,
Tell this soul, with sorrow laden, if within the distant
Aiden,
It shall clasp a sainted maiden, whom the angels name
Lenore—
Clasp a rare and radiant maiden, whom the angels name
Lenore.'

Quoth the Raven: 'Never more.'

'Be that word our sign of parting, bird or fiend,' I cried
upstarting;
'Get thee back into the tempest and the night's Plutonian
shore;
Leave no black plume as a token of that lie thy soul hath
spoken!
Leave my loneliness unbroken! quit the bust above my
door—
Take thy beak from out my heart, and take thy form from
off my door!'

Quoth the Raven: 'Never more.'

And the Raven, never flitting, still is sitting, still is
sitting,
On the placid bust of Pallas, just above my chamber
door;
And his eyes have all the seeming of a demon's that is
dreaming,
And the lamp-light o'er him streaming, throws his shadow
on the floor;
And my soul from out that shadow that lies floating on the
floor,

Shall be lifted—Never more.

We are disposed to believe that even these verses, detached as they are from the poem, and affording only an imperfect idea of its effect as a whole, indicate more than ordinary power. It is certainly unique in American literature, as much so as the *Christabel* and *Ancient Mariner* of Coleridge are in our own; and unquestionably a poetical reputation has been earned by things that will not bear comparison with it for a moment, even in point of artistic construction merely, for there is a wonderful harmony between the feeling and the rhythmical expression. The peculiar irregular music of Poe's poetry is not the least striking proof of its original character. Style may always be imitated within the ordinary limits of mere versification, but that structure of rhythmical cadence which takes its form from the things expressed, is peculiarly the work of genius. Poe has carried this to an extreme in certain strains of inner music, so to speak—poems which have arranged themselves within the author's fancy both as to the thought or feeling and the rhyme; but the former being obscure, the latter is to a great extent unintelligible, and in some instances discordant. Some stanzas from a piece, entitled *The Bells*, will suffice to illustrate the power he shews in maintaining the completeness of the harmony between the idea and its expression.

Hear the sledges with the bells—

Silver bells!

What a world of merriment their melody foretells!

How they tinkle, tinkle, tinkle

In the icy air of night!

While the stars that oversprinkle
All the heavens, seem to twinkle
With a crystalline delight ;
Keeping time, time, time,
In a sort of Runic rhyme,
To the tintintabulation that so musically swells
From the bells, bells, bells, bells,
Bells, bells, bells ;
From the jangling and the tinkling of the bells.

Hear the loud alarm bells—
Bræzen bells !
What a tale of terror, now, their turbulency tells !
In the startled ear of night,
How they scream out their affright !
Too much horrified to speak,
They can only shriek, shriek
Out of tune,
In a clamorous appealing to the mercy of the fire—
In a mad exhortation to the deaf and frantic fire ;
Leaping higher, higher, higher,
With a desperate desire.
O the bells, bells, bells !
What a tale their terror tells
Of despair !
How they clang, and clash, and roar !
What a horror they pourtray
On the bosom of the palpitating air !

This is an achievement in versification which even Southey, curious and studiously desirous of excelling in such things, has not equalled; it greatly surpasses most of his efforts, indeed, inasmuch as the imagination evinced in the last stanza we have quoted surpasses mere feats in rhyme.

We have already said, that Poe's poetry may be regarded as in a very special sense the expression of his own self-consciousness. Wild and melancholy as is its general character, there are a few strains which shew that the spirit of the wretched poet was sometimes visited by dreams of surpassing beauty—glimpses of purity—of passionate yet exalted love, and of a higher faith than that of his ordinary life even at its best. It would seem as if in these his genius vindicated itself by a protest of beauty against the gloomy broodings of a disquieted conscience or the frenzied excesses of a vicious life; and yet the beauty ever wears the hue of sadness.

The prose works of Edgar Poe are for the most part susceptible of being accounted for on the principle we have already hinted at—namely, that which places them in a completely different light as regards their author's own being from the poems. They are of two classes—those in which a strong yet gloomy imagination creates consistently with its own nature, exploring the deepest depths of the horrible; and those in which a keen, clear intellect is more predominant than imaginative power. The combination of these two characteristics in the works of a single man, must ever infer no ordinary degree of intellectual strength: in the works of such a man as Poe, it is somewhat extraordinary. Let the reader turn to his singular sketch, entitled *The Purloined Letter*, or to some of his criticisms, after reading such things as *The Fall of the House of Usher*, or *The Cask of Amontillado*, and he will find it difficult to believe that the acumen, the clear, vigorous reasoning of the former, could ever have proceeded from a man of such a wild and morbid imagination as is evinced in the latter. Such, we are told by his biographer, was Poe's success in combining both these characteristics by admirably sustained argument on imaginary evidence, and in a supposititious case, that many of his readers could not be persuaded of its fictitious character. And yet we have seen what was the nature, the life, and death of this sad wreck of genius and humanity. Judging from the works he has left, Poe is unquestionably the most original

imaginative writer America has yet produced. There is not a line in all his poetry which suggests the idea of imitation; and nothing in his prose—if we except his wilder tales, which are like so many refinements on the gross horrors of old German romance—to which we could adduce a strict parallel.

THINGS TALKED OF IN LONDON.

February 1833.

THE approach of the vernal equinox is reviving the subject of emigration—that is, if a subject can be said to have died which has been from time to time galvanised by news of the arrival of ships with tons of gold on board, not such mere handfuls of ounces as used to be considered great prizes in the days of the old Spanish galleons. The exploits of the buccaneers read tame, now that we are familiarised with the results of the diggings, and have a promise of their continuance. Besides five new gold-fields, a number of diamonds have been found; and if report speak truth, gold has been discovered in New Zealand also. Present indications shew, that the numbers willing to try their fortune in Australia will not be smaller this year than the last. At Southampton, a capacious lodging-house has been fitted up by the commissioners for the accommodation of emigrants while waiting their departure; and due precautions are taken to preserve health and morality. If similar establishments, equally well looked after, could be promoted in other large ports, the benefit would be extremely great, for there is a dark as well as a bright side to the prospect of the golden antipodes. Ships have arrived in the Australian ports with a loss of from 50 to 100 passengers by death during the voyage, and, as it appears, from overcrowding; and reports not less fatal have been heard from ships spoken on the passage. So there seems to be as little limit to the stowage of a ship as that of the pit of a theatre. No money being returned in either case, you are left to survive the squeeze as best you may. This question of overcrowding, however, is far too serious to be passed over lightly; and if acts of parliament are not strong enough to prevent a species of slave-ship packing, it is imperative on all who are bent on expatriating themselves, to stipulate for ample space and plenty of air. Besides the contingency of death by the way, we are beginning now to get news from some of the thousands who went out in 1852; marvellous news in some cases, distressing in others; and many exclaim with Touchstone in the forest: 'When I was at home, I was in a better place.' Disappointments will necessarily abound, until the rude social elements of the new country shall have become tamed into something like civilisation. The recent opening of the first Australian university, may perhaps be regarded as a proof that knowledge is in request as well as gold; and now that our government contemplates leaving the respective colonies to govern themselves, we shall have an opportunity of seeing what sort of liberty will be most acceptable to our antipodean brethren. Meantime, all sorts of emigration facts are discussed with great interest: 299,504 emigrants landed in New York last year; 10,000 went overland from the States to California; the number that left Ireland, it is estimated, will considerably exceed that of 1851, when it was more than a quarter of a million. It is a fact highly creditable to Irish emigrants, that in 1852, the sums remitted by them to their friends and relatives at home, amounted to £990,000.

The means of emigration, too, are occupying a large share of attention. Certain earnest projectors will not hear of more than fifty days for the passage to Sydney; and so we are to have an 'Australian Direct Steam-navigation Company,' whose boats are to ply on either side, to and from the Isthmus. Another scheme is for screw-clippers by the same route; but seeing that the

Marco Polo sailed to Melbourne and back in a little over five months, it is pretty clear that capability for speed does not belong alone to steamers. Most promising, however, for a shortening of the distance, is the renewed proposal for a ship-canal across the Isthmus, traversing the territory of New Granada, from Port Escoses on the Atlantic, to San Miguel on the Pacific. Certain concessions, it is said, have already been obtained for this route, which is shorter than any yet surveyed for a similar purpose, being not more than thirty-nine miles; besides which, the district is generally dry, and consequently more free from fevers and noxious insects than the swampy regions. In order that the work shall fully answer its purpose, the project is to cut a canal which shall be 30 feet deep at low-water, 160 feet wide at the surface of the water, 140 feet at the bottom, and without locks. This would admit of the largest ships passing from one ocean to the other in five hours; and we are told that any smaller dimensions than these would be inadequate to the purpose. The estimated cost is twelve millions sterling. Only let the promoters create an Isthmian route without transhipment, and they will soon have satisfactory evidence, in the shape of profitable tolls, of the course which trade will take to and from the other side of the globe.

The Americans seem determined to establish a communication in their own way; the legislature of the state of New York is said to have sanctioned a scheme for a railway from some place high up the Mississippi, to California. Six hundred miles of the distance are to be completed in the first year. Good-by to all the romance about buffalo-hunting, and adventures among the Sioux and Blackfeet, as soon as the steam-whistle shall be heard on the prairie! Much more might be said about enterprise in relation to travel, but there are other subjects to be noticed. One is, Mr Ragan's proposal to cut off a portion of the Mississippi, where that river joins the Missouri, by a canal leading to Lake Michigan, which, draining away the surplus waters, will save the plantations and towns on the lower course of the stream from the disastrous floods that now so frequently occur.

Education and its effects still engross a share of talk; but whether enough is or can be done, remains a question. There are at present 110 Ragged Schools in and around London, with 13,700 scholars, and 1850 teachers, of whom 200 receive payment—the others are voluntary. Since the commencement of these schools, nearly £3000 have been collected for their support. Great hopes are entertained from the work thus more or less beneficially carried on in a stratum of society too long neglected. But it must not be forgotten that education has many appliances, and encouragement should be given to the means of cleanliness; and seeing that the reports of our several baths and wash-houses for the past year are eminently favourable, we may believe that the connection between physical and moral purity, and the necessity for a repeal of the soap-tax, are beginning to be understood. Improved dwellings, which are also material aids to education, do not present themselves so numerously or suitably as was expected, probably because the rents of those already erected are too high for the mass of the working-classes. Boards of directors are too apt to assume that they know best, and this is a frequent cause of retardation in what would otherwise be a lively forward movement. Thin putting on of the break where it is not wanted, will doubtless go the way of all other errors when it has done its due share of mischief. Meantime, we must all help on the cause of enlightenment; and of this we have another gratifying instalment in the repetition of the sixpenny courses of lectures for working-men, which were delivered with so much success last winter at the Museum of Economic Geology.

Those who consider the theatre as a branch of education, are sanguine as to the beneficial results that

may follow the abolition of the practice of admitting crowds of people to the play by 'press-orders.' The practice is one that has been frequently condemned, but it survived condemnation until the present season, and now we may hope that it is gone past recall. One effect will probably be a reform of the machinery by which seats are obtained in theatres, and lowering of the prices of admission; for managers won't like to see the space so long filled by the non-payers remain permanently empty.

Of scientific matters, some have attracted more than ordinary interest—one of them being Sir Charles Lyell's return from America with a land-shell, and the remains of a fossil reptile, found in a fossilised tree standing erect in the coal-measures of Nova Scotia. The reptile is proved to be a *batrachian*, allied to species yet existing in the United States; and coupled with the fact, that a somewhat similar fossil has been discovered in Lanarkshire, it is causing geologists to reconsider their conclusions about air-breathing animals, and other phenomena of the coal-period. We have information, too, that gold has been found in more than one place in Canada; and we shall doubtless get a full report from Mr Logan, the government-surveyor, as soon as the snows have melted; but if the Canadians are wise, they will not abandon their deposits of copper on Lake Superior for any mere 'prospect' of more precious metal.

Professor Owen also has added another animal to our palaeontological catalogue, from a study of bones sent to him from Patagonia. He calls it the *Nesodon*, a strained and fanciful name, but by which he proposes to distinguish certain quadrupeds of the pliocene and miocene periods, hooved and herbivorous, and of which he makes out four species. One resembled a sheep, another a llama, while a third was as large as the rhinoceros. The discovery is said to establish the fact of the large ternary division of hooved animals, by which certain discrepancies, hitherto unexplained, are reconciled. Marcel de Serres may use this as another illustration in his discussion on the causes of the difference of size in ancient and present races of animals. He shews it to have been due to the presence of heat, moisture, and carbonic acid, in much greater amount than at present, though not producing the same effects alike on all. Those creatures which could live with least oxygen—such as molluscs, burrowers, and reptiles—would be prodigiously developed; while, owing to the absence of insects and birds, vegetation grew to gigantic proportions unmolested. Before leaving this subject, it may be mentioned, that Agassiz proposes to reform the present classification of insects, and instead of ranking them according to external form, or by the egg or embryo, to class them in two great divisions—*Chewing Insects* and *Sucking Insects*. He assigns the highest place to the sucking and supports his view with many learned and able arguments, which will give naturalists a subject to talk about for some time to come.

Dr Tyndall's Researches on Molecular Physics, laid before the Royal Society, are considered well worthy of notice by the *savants*. As yet, we have only the first portion, the 'Transmission of Heat through Organic Structures,' in which the doctor describes an instrument of his own contrivance, combining a thermo-electric pair of bismuth and antimony, with a galvanometer, a small battery, and other necessary fittings. With this he has experimented on fifty-four different kinds of wood, and measured the amount of heat transmitted in one minute across their different surfaces; and he finds that 'at all points, except the centre of the tree, wood possesses three unequal axes of calorific conduction, which are at right angles to each other. The first and greatest axis is parallel to the fibre; the second is perpendicular to the fibre, and to the annual layers of the wood; while the third and least axis is perpendicular

to the fibres, and parallel to the layers.' It is rather remarkable, that these axes coincide in quality and strength with the axes of elasticity discovered by Savart. But the facts are interesting in another point of view: they confirm the conclusions of those who have studied the phenomena of vegetation, and explain why it is that trees bear great changes of temperature without injury. The conducting power is up and down, and not across the grain; besides which, as Dr Tyndall shews, the bark is a very much worse conductor than the wood it protects. Again, it is found that the difference of conducting power between silica or rock-crystal, and gypsum, is nearly eighty degrees; gypsum being about on a par with wood, while silica is a better conductor than some of the metals. Hence the difference of temperature between a forest and a sandy region. If the great Sahara and some other deserts were composed of gypsum instead of silica, what a change would take place in their aspect and climate! Intense heat, we may believe, would be exchanged for genial warmth.

In connection with this subject, some of our philosophers are discussing the views lately put forth by Mr Rankine, as touching the diffusion and ultimate loss of heat by the globe, whereby, as Professor W. Thomson shews, it is to become uninhabitable. Mr Rankine considers, that as the heat goes off into space, it may be concentrated in certain foci, from which it will in time depart to fulfil its functions anew; and these foci he places in some very remote region of space. 'At each of these foci,' he says, 'the intensity of heat may be expected to be such, that, should a star (being at that period an extinct mass of inert compounds), in the course of its motions, arrive at that part of space, it will be vapourised and resolved into its elements, a store of chemical power being thus reproduced at the expense of a corresponding amount of radiant heat.' On this assumption, he shews that the bright spots in the heavens, which have from time to time puzzled astronomers by their sudden appearance or disappearance, may have been some of these foci. The theory is ingenious, but it seems to involve an error in assigning a limit. The astronomer-royal, who is provoking some discussion by his paper on the Eclipses of Thales, Agathocles, and other ancients, will perhaps have something to say to it.

Our Statistical Society is debating the subject of a *just and equitable income-tax*, which will doubtless interest tax-payers in all parts of the kingdom; the Ethnologicals are unveiling a little more of the history of the Australian aborigines; the Civil-engineers are talking about fire-proof buildings, and the preservation of timber; and our Antiquaries, instead of ascertaining particulars concerning the heretofore unknown city recently disinterred in Egypt, are making mistakes about Ben Jonson. On the Thames, experiments have been made by which, if successful, steamers are to burn their own smoke; the process is said to consist in passing a hot blast through the furnace. Some of our ship-builders, inspired by the success of the tubular bridges, are taking up once more the question of iron masts; and it is stated that tubular masts may be made of iron, stronger and lighter than those of wood, and with the additional advantage, that they might slide down one into the other, telescope fashion, while they would require neither shrouds nor stays, leaving room for bracing round the yards to the outermost. Ship-builders must neglect no means of speed, now that the *Ericsson calorix* ship has proved her capabilities. There is something, too, for paper-makers to consider, in the fact that Herr von Pannewitz, the inventor of the process for making wool from pine-trees, has recently presented to the king of Prussia specimens of paper made of the same material. Another ingenious individual, at Giersdorf, has also made paper from the red pine, which is so white and good as to be fit for writing

or drawing, and needs no sizing, because of its resinous quality.

Of literature: some publications have appeared of late worth noticing and worth reading. Chevalier Bunsen's *Hippolytus* is one of those works which advance learning and promote thought; while the distinguished author's announcement, that he hopes ere long to bring out a life of Christ, on which he has been engaged for many years, is one fraught with promise to a large class of earnest readers. A few readable voyages and travels have made their appearance; and if the resources of India and other portions of our empire are not developed, it will not be for want of books thereupon. Professor Phillips has given us a new edition of his *Rivers, Mountains, and Sea-coast of Yorkshire*; Sir Roderick Murchison is going to appear in 'siluria,' the purport of which may be guessed by those who have read his former works; Layard is ready with his second excavations at Nineveh and Babylon; and the prison-inspector favours us with a volume of 'crime,' wherein we may read of wrongs and remedies. Fiction is forthcoming in any quantity, from the worthy to the worthless: as yet, Thackeray's *Esmond* remains the best novel of the season. Some of our popular writers have betaken themselves to distant lands, intent on book-making, and we shall soon get Australian experiences by the ram. And though last, not least, remains the rumour, that we are shortly to have a life of Frederick the Great from the pen of Thomas Carlyle.

LORD CARLISLE AT BURSLEM.

AMONG the social phenomena of the day, is the appearance of noblemen, and gentlemen of rank or literary reputation, on the platforms of mechanics' institutions, and other establishments designed to improve and elevate the humbler classes of the community. It is unquestionably one of the signs of the times, to see such men as the Earl of Carlisle, Earl of Pannure, Lord Kinnaird, Lord Belfast, and Lord John Russell, coming forward with popular addresses—doing what they can to set an example to those who, from habits and traditions, seem disposed to entertain fears respecting the intellectual advancement of the masses. Apprehensions of this kind, it is needless to say, will not now have any efficacy. The world is on the move, and it is the part of wisdom to direct it in a proper course, not to stand aloof and let it drift among hidden but not less certain dangers.

The merit of taking an early and genial interest in efforts at popular improvement, is perhaps mainly due to the Earl of Carlisle, and none in his sphere seems to be so continuous in helping on the good cause. The latest of his lordship's appearances occurred only a week or two ago at Burslem, in Staffordshire, on the occasion of an annual meeting of the Potteries School of Design. As the account of this assemblage will have been seen by few of our readers, we may be permitted to extract a few passages from his lordship's address, having reference to the arts of design and embellishment, and interesting to operatives in every profession.

'It is not to be forgotten (I draw for my information upon an able and interesting lecture, recently delivered by Mr Arnoux), that close upon two hundred factories are said to be employed in the English Potteries, the aggregate annual value of whose productions is estimated as high as two millions of pounds. Eighty-four millions of pieces were exported in the year before the last; and in that net-work of industry which covers the neighbourhood immediately about us, sixty thousand people are believed to be employed in this species of manufacture. Now, to mention these bare statistical facts,

seems to be a far more real and impressive tribute to the importance of the pottery manufacture, than to dwell on the venerable antiquity of its origin, or the repute and dignity with which, from the earliest ages of mankind, it has been invested. With respect,' continued his lordship, 'to the special object of our being gathered here to-night. I have intimated that the peculiar aim of all concerned in pottery, should be to make the highest amount of beauty minister and subservient to the utmost extent of use. Now, as for use, I think we may safely trust the strictly-practical, straightforward, not over-romantic genius of our countrymen, for finding out what is most wanted, what would be most welcomed, what would suit the greatest number of customers; but we have not the same warrant for relying upon their unaided and uninstructed aptitudes to use the best artistic discrimination, to employ the most happy combinations in colour, and to select the most faultless shapes and proportions in form. It would be most illiberal and unjust not readily and thankfully to admit, that great advances have already been made. It is not in the very heart of the district that gave birth to Wedgwood, and to others subsequently, many of whom I have now the pleasure to see around me; it is not in the neighbourhood of the British Etruria, for which Flaxman designed and Wedgwood wrought, that I should think of using the language of disparagement or discouragement. May I not, in our present day, refer to the new manufacture called Parian, which, I believe, may exclusively be called our own, which combines such purity of material, with such capacity for all that is most exquisite in form? To bear me out, need I mention the Ariadne, the Io, the Dorothea, and the Vintage? We remember with pride the station which Staffordshire occupied in the Great Exhibition of 1851. Where was it, in that proud display of all the productions, and that eager throng of all the races of the world—where was it that, day by day, from the first opening of the doors at morn to the last crash of the gong at eve, the crowd seemed nearly the thickest, and the means of passage the most difficult?—would you not name the gallery that overlooked the transept at its north-western angle? But it is one thing to droop and to despond—it is another to presume and to stagnate. You all know the excellence that still adheres to the illustrious manufactures of Sevres. I am again indebted to the learned exposition of Mr Arnoux for the fact, that the present exportation of porcelain from France amounts to the very large annual sum of L.800,000. We have all the elements of success about us—great choice of material, great command of fuel, intelligent workmen, an increased appreciation of the true principles and laws of art, a far larger attention bestowed on such objects, both by individual patronage and the public at large; but there is ample call for exertion; and if there is no progress, there will, probably, be falling off and defeat. It is with this view that the establishment and encouragement of Schools of Design become of such first-rate importance; and if there ever was a district or a species of manufacture for which, beyond all others, they are adapted and required, it is for this district and for your manufactures. The art of design comprehends alike the proper conception of the pattern, and admixture of the colours; so far, indeed, it may be equally applicable to the textile manufacture, but in the pottery manufacture, design is also lord-paramount over the proportion and the shape, which it cannot be said to be in the article of dress; or else how would its unchanging laws of proportion have to fit from the long waist to the short waist, and all sorts of ampler or more contracted circumferences? There is, then, no portion of the composition of the piece of pottery, whether it belongs more especially to the painters, modellers, gilders, or others, in which the art of design has not its appropriate place.' After alluding to the excellence of the Potteries School of

Design, and the advantages to be derived by attending it, his lordship said: 'I understand that two of the most meritorious pupils of this school have been elected to Government Scholarships. I trust that this precedent may be the means of inducing more of the young men of the district, and especially of those engaged in the staple manufacture, to avail themselves even more extensively of the opportunities provided for them, than they have yet done. I would most earnestly counsel them not to be deterred by any false shame, even if they have to take to the work of study later than others by whom they may be surrounded. Multiplied experience in every department of industry and art sufficiently proves that man is never too old to learn; and that there are some things, whatever the natural turn or talent may be, that can never be mastered without a proper amount of learning and training. The great want of regular industrial training has been long felt in this country, in the departments alike of its science and its art. There is among us no lack of inventive genius; there is a signal abundance of energetic industry; but the exertions of both are frequently desultory when they might be systematic, and scattered when they might be concentrated; so that, enterprising and successful as in many instances British industry has been and continues to be, it is still, in the opinion of all most competent to judge, susceptible of still higher development, and more uniform excellence. A design is, at this time, in the course of accomplishment, under the highest and most enlightened auspices, for establishing in London a great central institution for arts and sciences, which is intended to serve as a nucleus and a pattern for all kindred local institutions throughout the country. I may refer you for information as to the principles upon which the scheme is recommended, and the basis on which it rests, to the late excellent report from the Royal Commissioners for the Exhibition of 1851, upon the disposal of their surplus. It is hoped that the benefit of considering industrial training as a whole, will be appreciated in the country as well as in the metropolis. As one more casual illustration applicable to this district, must it not be plain that an adequate knowledge of the principles of chemistry would be as requisite for the full understanding of the business of a potter, as an adequate knowledge of drawing and design? I hope, too, it may be found practicable to establish a museum in connection with the local school, as it seems to me that it would be of the very first importance to have a collection easily accessible to the pupils of the school and workmen of the district, illustrating the various processes of Ceramic manufacture, and containing specimens of its most approved productions. The scheme proposed for the district will combine the advantages of enlightened central superintendence and district local energy. It appears that, for this head school, the government proposes to grant the liberal sum of L.600 a year; but they do this in the reasonable confidence, that their aid will be met by corresponding exertions in the district. I trust they will not be disappointed in this just expectation, and that it will be borne in mind, that, if it is a worthy object for the government of the country to foster the taste and spirit calculated to impart success and vigour to an important department of the national commerce, so it is doubly incumbent on the manufacturers and others interested in the wellbeing of this populous neighbourhood, not to neglect the means now offered to them of keeping up and adding to its ancient credit, and insuring its continued progress and permanent welfare. I cannot close this imperfect address to the intelligent and interesting audience before me, without a word—a very brief word—in a different line of observation. While we are met here mainly to promote the success of industry and the progress of art, let us not forget that there are yet higher, more essential, more durable

interests to be looked after in all human training. I have alluded once to the frequent illustrations from the work of the potter made use of in Holy Writ. We are all of us children of the clay, and moulded by the Almighty hand, modelled after the Divine likeness: the lowest and meanest among us may be formed into the vessel of choicest honour, and set apart for the highest place in the paradise of our God.'

The glowing sentiments with which his lordship thus concluded his address, were received with universal applause; and it is only to be hoped they will meet with as ready a response in the practical aims which the noble speaker recommended to the attention of his hearers.

AN AMERICANISM.

In a late American newspaper, we find that a public eulogy had been pronounced at New York, on a female professional singer, Madame Sontag, by a clergyman, as representing his brethren and others. Curious as this appears, we are not quite sure that it is inconsistent with sound philosophy. Better to recognise and superintend public amusements than ignore or persecute them. The following is the paragraph in question:—

'The great Sontag gave her first grand festival concert, aided by 600 to 700 performers, in New York, on Monday evening last. At the dress rehearsal, on the Saturday previous, the clergy, the pupils of the Blind Institute, the press, and numerous other favoured guests, were invited, and attended; and at the close, Dr Cox was deputed to return thanks to Madame Sontag, on behalf of the clergy, which he did in his usual eloquent, and facetious manner, closing as follows:—"We have listened, also, to the harmonious sounds elicited by the instrumentalists by whom you have been supported; but, with all due deference to them, I must say, we would much rather listen to an instrument of another sort, designed and made by hands unseen, from the carols of which have proceeded the melody and harmony which have enraptured us this morning. Allow me, before I take my seat, to say that we all feel grateful for the privilege you have extended, and to observe, that we clergymen are ready to take up the challenge, and to give you and your associates a free ticket to hear us to-morrow morning. (Laughter.) I am reminded by your harmonious voice of Him whom we serve, and can almost imagine what kind of music was that which first struck its key-note in heaven. We all hope that you may long continue to retain the rich gift with which you have been endowed, and may you long continue to exercise it among the millions of the ransomed of the land. May we long be free, by the grace of God, to praise Him with song, circling His throne day and night with rejoicing!"'

FRENCH IN THE ENGLISH LANGUAGE.

Whilst many French words have been introduced into the English language, preserving to a great degree their sounds, and remaining entirely French—such as *au fait*, *bonne bouche*, *bon gré*, *cognac*, *cortège*, *à propos*, *tête-à-tête*, &c.—it is curious to observe how many others, though of a French origin, have been so much altered by the pronunciation as to render them scarcely recognisable. *Dandelion*, for instance, is a transformation of *dent-de-lion*; *demure*, of *des mœurs*; *tinsel*, of *étincelle*; *kickshaws*, of *quelque chose*; *curfew*, of *couvre-feu*. *Burdie-house* is said to be *Bordeaux-house*; and, according to Miss Strickland, *Charing-cross* was so called from being one of the places where Edward erected crosses in memory of his *chère reine* Eleonore. It is not uncommon, also, to see words introduced in a language, under a popular form, which come from a misapplication of sounds. A curious instance of that kind of mistake is found in the word *Jerusalem*—applied, instead of the original Italian name, *Girasole*, to the *Jerusalem* artichoke. In the same manner, two Latin words, *olus atrum*—literally, black pot-herb—have become *Alexanders*, the popular appellation of an umbelliferous plant.—*Scottish Educational Journal*.

FIRE REVELATIONS.

BY CALDER CAMPBELL.

As now within my winter's fire I look,
I seem to see
Pictures, and shapes that seem to gaze at me,
Like midnight stars from some clear summer brook
O'er which no cloud its mist-lined flag hath shook.

A palace or a prison starts before me,
With battlements
That frown austerely o'er besieging tents,
'Mid which the shadow, Death, stalks red and stormy,
Whirling his lightning-banner sternly o'er me.

Faces beloved but passed away I see—
The beautiful,
Whose hearts with mine taught in the same fond
school

Brake in that strife which hath but shattered me,
Whose harder nature braves grief's agency.

The beautiful, the dear, the true are there—
The false likewise;
The false and cruel with their cunning eyes,
Or smiling with a presence insincere,
That but for burning flames would chill all near.

I look on scenes, piled in the blazing grate,
Of early days :
My pastoral home, whence first I sought the ways
That lead from passionate love to passionate hate
Through the entangling maze of man's estate.

The hills of Scotland and the woods of Ind
Gleam in the glow;
Struggles and strifes, the battle, and the brow
Laurelled, but bloody, in the fire I find,
With graves of loved ones 'mid grass-shaking wind !

Scent-eloquent flowers and inarticulate weeds
Before me speak
Pathetic sentences, that nearly break
My heart with memories of such love as leads
Downwards through death, where life to death succeeds!

Stir, stir the fire! destroy the spectral strife
That shows the Past;
Give me the Now—nor let me look aghast
On grieving graves with but the Human rite—
Onward the Future shines, bright with Immortal life !

REPOSITORY OF TRACTS.

We have been asked by various persons, whether the cheap publication lately commenced by us, under the title of CHAMBERS'S REPOSITORY OF INSTRUCTIVE AND AMUSING TRACTS, is a re-issue of the MISCELLANY OF TRACTS, published a few years ago. We have to intimate, that the REPOSITORY now issuing is an entirely new work; it resembles the MISCELLANY only in size and price; the matter is new, and prepared on purpose. A Number appears every week, a Part every month, and a Volume, neatly done up for the pocket, at the end of every two months. Two volumes (s. each) have now appeared.

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